GAMMA 2026

5 - 6 November

Day 1, 05. Nov. 2026

9:30 - 10:30: Elia Bruè: Nilpotency and Curvature Lower Bounds

We discuss the structure of fundamental groups of closed manifolds with lower curvature bounds. In particular, we focus on the Fukaya–Yamaguchi Almost Abelian Conjecture and provide a counterexample under the nonnegative Ricci curvature assumption. This is joint work with A. Naber and D. Semola.

10:30 - 11:00: *Coffee break*

11:00 - 12:00: Daniele Valtorta: Quantitative stratification and applications

This talk is not about a single topic, but a technique and its applications. Quantitative stratification was introduced by Cheeger and Naber and roughly speaking consists in the analysis of singularities appearing in GMT using a quantitative version of Federer's dimension reduction argument. In layman terms, quantitative stratification analyzes singularities using approximate symmetries of the objects under study. Even though the technique and the estimates get quite technical, the underlying ideas are almost straightforward. We will present some sample results on harmonic maps and solutions to elliptic PDEs, but the strength of the technique is its versatility and applicability to different problems. Other applications of the technique are possible in yet unexplored scenarios, which leaves the door open for PhD projects.

12:00 - 14:30: *Lunch break*

14:30 - 14:50: Kiichi Tashiro: Existence of capillary Brakke flow

Mean curvature flow is one of the most important geometric flows and it can be viewed as the L_2 gradient flow of the surface area functional. When one incorporates capillary effects into the surface area, a contact angle condition arises as an inhomogeneous Neumann boundary condition. Although the variational properties of the capillary effects have been extensively studied, relatively few studies have addressed about mean curvature flow with contact angle condition. In this talk, we present an existence theorem of such a flow under the general situation whenever possible.

15:00 - 15:20: Daniele De Gennaro: Flat flow weak solutions to the mean curvature flow and their BV-Brakke structure

We present a recent result concerning a class of weak solutions to mean curvature flow known as flat flows. These solutions arise as limits of the minimizing movements scheme associated

with this geometric evolution and have been extensively studied in the literature. However, whether they satisfy the appropriate limiting evolution law under general assumptions has remained an open question, as previous results typically required an additional assumption on the convergence of interfacial energies. We show that flat flows possess a BV-Brakke structure, and hence satisfy the expected evolution law, without any assumption on energy convergence. The talk is based on a joint work with S. Stuvard (UniMi)

15:30 - 15:50: Qin Deng: Topology of two-dimensional collapsed spaces with lower Ricci bounds

It has been known since the foundational work of Cheeger–Colding that any noncollapsed Ricci limit space is homeomorphic to a manifold away from a set of codimension two. By contrast, the topology in the collapsed case can be very poorly behaved. For instance, Hupp–Naber–Wang and Zhou recently constructed examples of collapsed Ricci limit spaces, for any rectifiable dimension at least three, that are nowhere locally Euclidean. In joint work with Elia Bruè, we show that the situation is much better when the rectifiable dimension is two and that in fact such spaces are topological manifolds, possibly with boundary.

16:00 - open end: *Aperitivo*

Day 2, 06. Nov. 2026

9:30 - 10:30: Luciano Mari: Harmonic maps from S^3 to S^2 and an old conjecture of Eells: producing and digesting.

A classical problem in the theory of harmonic maps is to find which homotopy classes of maps from S^3 to S^2 admit a harmonic representative. An important example of harmonic map is the Hopf fibration as well as its post-composition with (anti)-holomorphic maps of S2. Are there others? We here describe new results in this direction, both from human beings and not. Joint work with A. Georgakopoulos, Q. Guo, M. Magliaro and A. Savas-Halilaj,

10:30 - 11:00: *Coffee break*

11:00 - 12:00: Marco Pozzetta: Isometric and warped spectral splitting theorems

A lower bound on the Ricci curvature of a Riemannian manifold in the spectral sense is expressed in terms of a lower bound on the spectrum of a Schrödinger operator that contains the Ricci curvature as a potential term.
The aim of this talk is to present sharp isometric and warped-product splitting results for manifolds with nonnegative Ricci in the spectral sense, extending the classical splitting theorem of Cheeger–Gromoll. Motivations and applications will also be discussed.
The results presented are obtained in works in collaboration with Gioacchino Antonelli and Kai Xu, and with Stefano Mannella.

12:00 - 14:30: *Lunch break*

14:30 - 14:50: Fanch Coudreuse TBA

TBA

15:00 - 15:20: Simone Verzellesi: An overview of the sub-Riemannian Bernstein problem

The Bernstein problem consists of characterizing global minimizers of suitable perimeter functionals: is it true that boundaries of global perimeter minimizers are flat? After a short review of the Euclidean Bernstein problem, we describe it in the prototypical sub-Riemannian model of the Heisenberg group. First, we recall the main known results in the first Heisenberg group, where the problem is well-understood. Then, we address the higher dimensional problem, presenting a recent counterexample along with some restricted affirmative answers. This talk is based on joint works with Gianmarco Giovannardi and Andrea Pinamonti.

15:30 - 15:50: Emanuele Cristoforoni: On the stability of the Kohler-Jobin inequality

In a recent paper, we developed a unified approach to quantitative versions of Chiti's reverse Hölder inequality and the Kohler-Jobin inequality. In this talk we will focus on the latter: among sets with prescribed torsional rigidity, the ball minimizes the first Dirichlet eigenvalue. We will discuss similarities and differences with other quantitative estimates such as those for the isoperimetric and Faber-Krahn inequalities. In contrast with these, we will show that the usual Fraenkel asymmetry is not suited to quantifying the Kohler-Jobin inequality. Instead, we will introduce a different asymmetry based on Γ-convergence.
Joint work with V. Amato, L. Barbato, A. L. Masiello, C. Nitsch, C. Trombetti, and F. Villone

16:00 - 19:30 *Aperitivo*

from 19:30: *Social dinner at Auum*